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Two new coralline algae from Culebra, Porto Rico

M. FOSLIE AND M. A. HOWE

(WITH PLATES 23-26)

Since the publication of our paper on "New American Coralline Algae,"* the island of Culebra, lying between Porto Rico proper and St. Thomas and now occupied by the United States as a naval station, has been visited by a collecting party from the New York Botanical Garden. Several coralline algae were secured there, including two rather large and conspicuous kinds which are quite different from any hitherto reported from the West Indian region and are, we think, entitled to characterization as new species. Descriptions of these two species are herewith given:

Goniolithon acropetum Fosl. & Howe, sp. nov.

Attached by a rather inconspicuous hypothallus and forming cespitose or difform masses mostly 4-12 cm. high, the single clusters usually 6-15 cm. in diameter, but often confluent and apparently larger; branches repeatedly subdichotomous, much anastomosed, compressed or subterete, 1.25-3.10 mm. in diameter, and subtruncate-capitate, or very often much dilated either at apex only or throughout and then forming flabella or foliar laminae 10-25 mm. broad (including anastomoses) and 1-2 mm. thick or commonly thicker in basal parts, the dilated portions often anastomosing in such a way as to form somewhat tubular or subinfundibuliform communicating interstices, the terminal flabella sometimes crested with short subterete or dentiform innovations; younger branches all conspicuously decutescent, the exfoliations papyraceous, revolute, and more or less concentric or zonate: medullary hypothallic cells $14-40\ \mu \times 11-20\ \mu$; perithallic cells $11-21\ \mu \times 9-14\ \mu$, heterocysts numerous; conceptacles of sporangia subconical becoming mammilliform, about 1 mm. in diameter; sporangia 4-parted, $90-168\ \mu \times 40-102\ \mu$. (FIGURE 1 and PLATES 23, 24.)

Growing on corals and on other *Melobesieae* in about 1-4 dm. of water (low tide) in a reef-sheltered cove near the mouth of the

* Bull. N. Y. Botanical Garden 4: 128-136. pl. 80-93. 17 Mr 1906.

main harbor of Culebra Island, Porto Rico (M. A. Howe, 3 March, 1906, no. 4224).

Goniolithon acropetum is probably most nearly allied to *Goniolithon frutescens* Fosl. f. *flabelliformis*, of the South Pacific, originally described* from Funafuti, but is evidently quite distinct from that species, being coarser,† more anastomosed, often much more widely dilated, and more conspicuously decutescent; the conceptacles of sporangia are somewhat larger (about 1 mm. diameter vs. 500–600 μ in *G. frutescens*) and are rather less abruptly conical, and the sporangia attain larger dimensions (reaching maxima of 168 μ in length and 102 μ in width vs. 110 μ and 50 μ in *G. frutescens*); the perithallic layer is thicker, and after decalcification the cells of both perithallium and medullary hypothallium appear more rounded at the angles and firmer-walled than in *G. frutescens*.

Conditions of *Goniolithon acropetum* with subterete branches sometimes bear a slight resemblance to forms of *G. strictum* Fosl.,

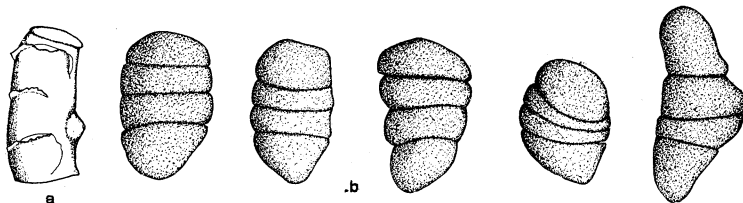


FIGURE 1. *Goniolithon acropetum*; a, end of a terete branch showing tetrasporangial conceptacle and exfoliations, $\times 5$; b, tetraspores, $\times 150$.

but are coarser, less fragile, and have less tapering branches. A small form of *G. strictum* was found growing within half a mile of *G. acropetum* and was always abundantly distinct.

On the other hand, forms of *Goniolithon acropetum* with dilated, flabelliform branches have a certain superficial resemblance to *Lithophyllum platyphyllum* Fosl. (St. Martin, West Indies) and *Lithophyllum daedaleum pseudodentatum* Fosl. & Howe (Porto Rico), but have really no close affinity with either of these. Both of the last named forms are either not at all decutescent or flake off only minute and irregular scales.

* Det Kgl. Norske Videnskabers Selskabs Skrifter. No. 1. 1900.

† Compare published photographs of *G. frutescens* f. *typica*, in The Fauna and Geography of the Maldive and Laccadive Archipelagoes 1: pl. 25. f. 4; and in Coral-inaceae Siboga-Exp. pl. 10. f. 7-9. 1904.

***Lithophyllum Antillarum* Fosl. & Howe, sp. nov.**

Thallus grayish-pink or decolorate when living, becoming pallid or greenish-pallescens on drying, forming often somewhat columnar rather flat-topped masses 10–30 cm. high and 8–20 cm. broad; branches much fused, forming in the basal parts an almost solid mass with more or less lacunae, the irregular and somewhat daedaleoid anastomoses extending nearly to the irregularly pyramidal, somewhat prismatic, subconical, compressed or occasionally subterete, often truncate or retuse apices, the free portions mostly 5–25 mm. broad and 3–12 mm. thick, often enlarging upward, the interstices commonly tubular or irregularly infundibuliform; surface smooth or subpulverulent, or, especially at the sides, minutely corrugated or rugulose; medullary hypothallic cells $7-18\ \mu \times 7-10\ \mu$, sometimes forming (in a longitudinal section) irregularly alternating rows of one short and two long cells; perithallic cells subquadrate or roundish, $7-10\ \mu$ in diameter; short rows of larger cells ($20-33\ \mu \times 14-20\ \mu$) occurring here and there in both medulla and perithallium: conceptacles of sporangia convex, but little prominent, $150-300\ \mu$ in diameter: sporangia 4-parted, $38-70\ \mu \times 20-40\ \mu$. (FIGURE 2 and PLATES 25, 26.)

Growing at low-water mark on a coral reef at Flamingo Bay, Culebra Island, Porto Rico (M. A. Howe, 7 March 1906, no. 4373).

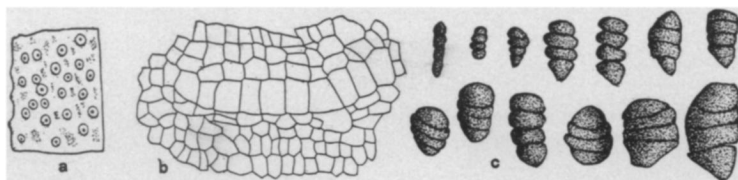


FIGURE 2. *Lithophyllum Antillarum*; a, portion of surface with tetrasporangial conceptacles, $\times 5$; b, portion of a radio-vertical section, showing row of enlarged cells $\times 232$ (the cells should be more rounded at the angles, as indicated in photomicrograph, PLATE 26); c, tetraspores, $\times 150$.

Lithophyllum Antillarum is evidently a reef-builder. In general habit it bears some resemblance to coarse forms of *Lithophyllum africanum* Fosl. (Cape Verde) and to well-developed conditions of *Lithophyllum craspedium* Fosl., a species originally described from specimens brought from Funafuti and since discovered in the Maldives (see Fauna and Geography of the Maldivian and Laccadive Archipelagoes, 1: pl. 25. f. 1). It is perhaps the more closely related to the latter species, agreeing essentially in structure even to the possession of the peculiar short rows of enlarged cells

apparent at frequent intervals in a radio-longitudinal section (FIGURE 2, *b* and PLATE 26; see also Corallinaceae Siboga-Exped. 59), but the West Indian plant is rather coarser and is considerably different in habit as will be seen by comparing our photograph (PLATE 25) with that of *L. craspedium* cited above, the branches being more inclined to increase in size upward and anastomosing in a more gyrose or daedaleoid fashion. We believe it should bear a distinctive specific name, at least until further collections give better grounds for understanding the relationships of West Indian forms to those of the South Pacific and Indian oceans. *Lithophyllum africanum* is less coarse than *L. Antillarum*, its branches are thinner, and more frequently subterete or compressed, though sometimes dilated and rather foliar, its medullary cells after decalcification are firmer-walled and more rounded at the angles, and the short rows of enlarged cells are rare.

Explanation of plates 23-26

PLATE 23

Goniolithon acropetum, natural size; the topmost specimen is the type.

PLATE 24

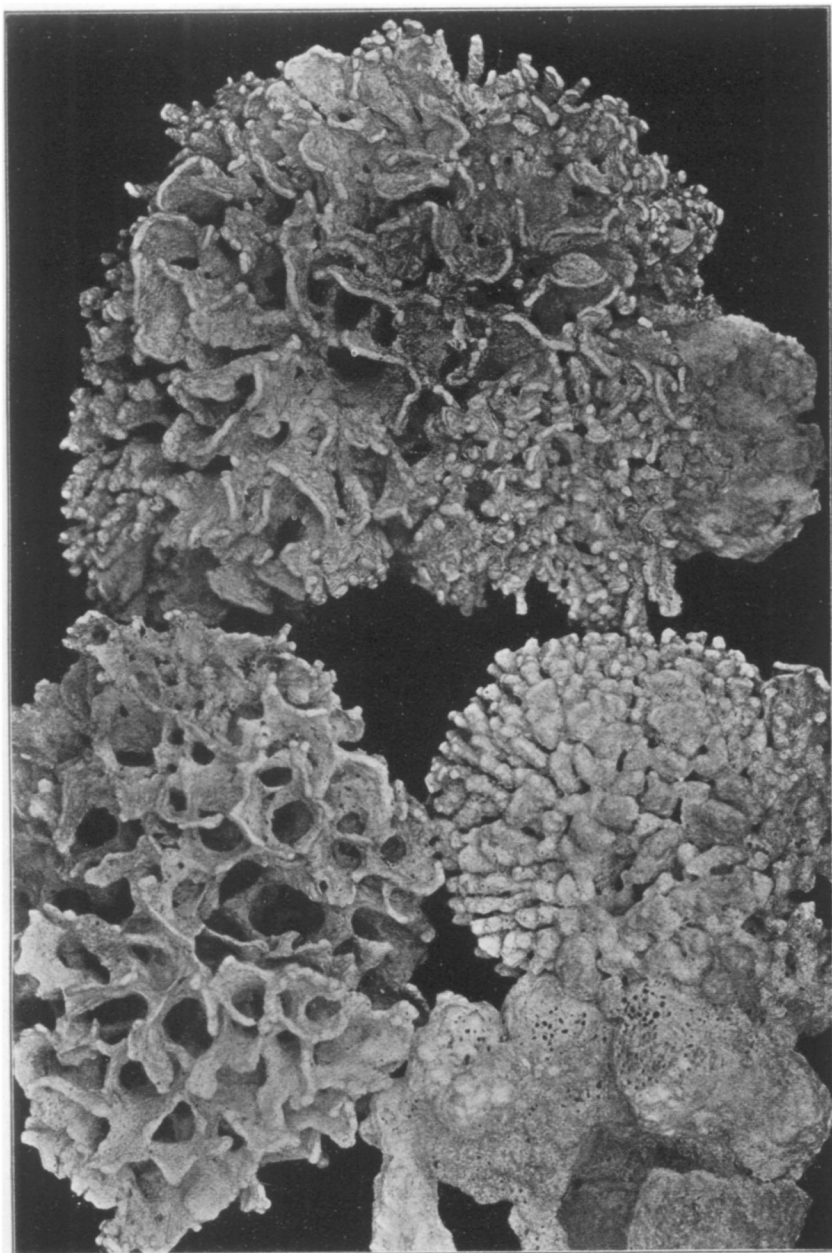
Goniolithon acropetum. Photograph of a sagittal section (decalcified) of a flattened branch, showing perithallium and portion of medullary hypothallium, magnified 165 diameters.

PLATE 25

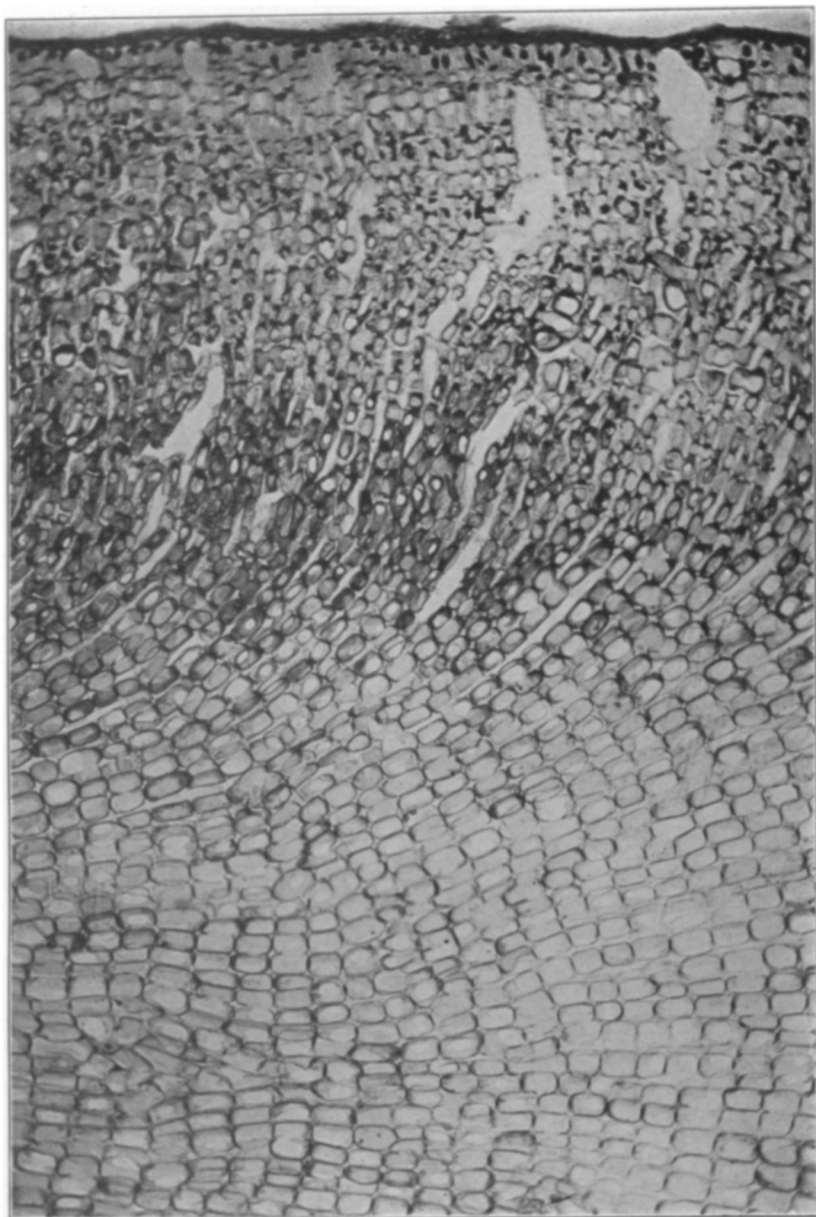
Lithophyllum Antillarum, natural size, the upper specimen seen from above, the lower from the side; the latter the type.

PLATE 26

Lithophyllum Antillarum. Photograph of radio-vertical section (decalcified) from the medullary hypothallium, magnified 165 diameters. The direction of growth is towards the upper left-hand corner.



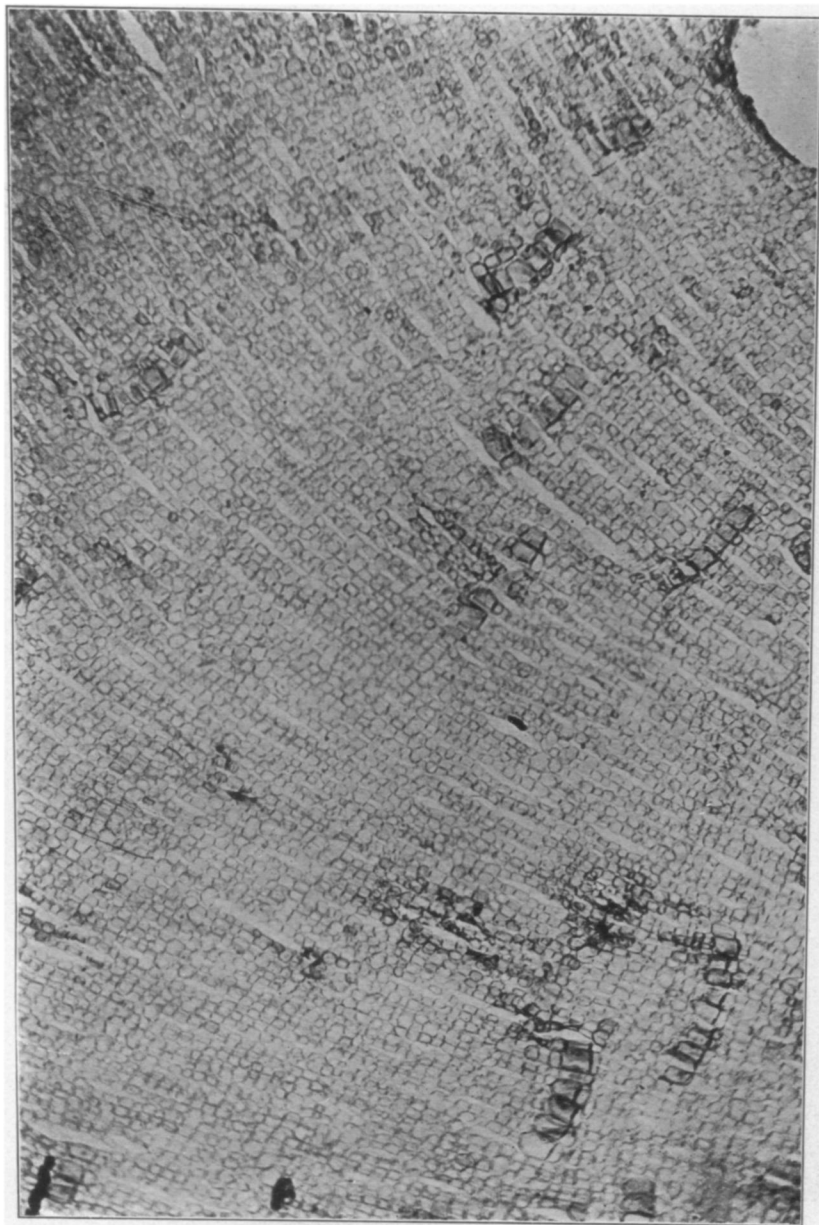
GONIOLITHON ACROPETUM Fosl. & Howe.



GONIOLITHON ACROPETUM Fosl. & Howe.



LITHOPHYLLUM ANTILLARUM Fosl. & Howe.



LITHOPHYLLUM ANTILLARUM Fosl. & Howe.